6560-50-P

U.S. ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 300

[EPA-HQ-SFUND-1994-0009; FRL-10009-99-Region 4]

National Oil and Hazardous Substances Pollution Contingency Plan;

National Priorities List: Partial Deletion of the Redstone Arsenal (USARMY/NASA)

Superfund Site

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule; notice of intent.

SUMMARY: The U.S. Environmental Protection Agency (EPA) Region 4 is issuing a Notice of Intent to Partially Delete Operable Unit (OU)-09 (OU-20 for Redstone Arsenal) and OU-12 (OU-21 for Redstone Arsenal), which are located on the George C. Marshall Space Flight Center (MSFC) within the Redstone Arsenal (USARMY/NASA) Superfund Site (Site), in Huntsville, Madison County, Alabama, from the National Priorities List (NPL) and requests public comments on this proposed action. The NPL, promulgated pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, is an appendix of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The EPA and the State of Alabama, through the Alabama Department of Environmental Management (ADEM), have determined that all appropriate response actions at OU-09 and OU-12 have been completed under CERCLA. However, this deletion does not preclude future response actions under CERCLA at the Redstone Arsenal (USARMY/NASA) Superfund Site which includes the MSFC.

DATES: Comments must be received by [Insert date 30 days after date of publication in the Federal Register].

ADDRESSES: Submit your comments by one of the following methods:

- https://www.regulations.gov. Follow online instructions for submitting comments. Once submitted, comments cannot be edited or removed from Regulations.gov. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be confidential business information (CBI) or other information for which disclosure is restricted by statute. Multimedia submissions, such as audio or video, must be accompanied by a written comment. The written comment is considered the official comment and should include a discussion of all points you wish to make. In general, the EPA will not consider comments or comment content located outside the primary submission, such as on the web, cloud, or other file sharing system. For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit https://www2.epa.gov/dockets/commenting-epa-dockets.
- Following Centers for Disease Control and Prevention (CDC) and Office of Policy

 Management (OPM) guidance and specific state guidelines impacting our regional

 offices, the EPA's workforce has been authorized to telework to help prevent

 transmission of the coronavirus [COVID-19]. As a result, there is a temporary shutdown

 of the EPA's Docket Center and the EPA Regional Records Centers. While in this

 workforce telework status, there are practical limitations on the ability of staff to collect,

 and for Agency personnel to respond to, "hard copy" mailed queries sent directly to

 Agency office locations. Therefore, until the workforce is able to return to office

- locations, the EPA recommends that, to the extent feasible, any correspondence mailed to the Agency should also be sent via email.
- For question on this Notice and submission of comments please contact Brad Jackson,
 Remedial Project Manager, U.S. Environmental Protection Agency, Region 4, 61 Forsyth
 Street SW MS9T25, Atlanta GA, 30303, (404) 562-8925, jackson.brad@epa.gov or
 Ron Tolliver, Community Involvement Coordinator, at tolliver.ron@epa.gov.

Instructions: Direct your comments to Docket ID No. EPA-HQ-SFUND-1994-0009. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at https://www.regulations.gov, including any personal information provided, unless the comment includes information claimed to be CBI or other information for which disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through https://www.regulations.gov or e-mail. The https://www.regulations.gov website is an "anonymous access" system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to the EPA without going through https://www.regulations.gov, your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the docket are listed in the https://www.regulations.gov index. Although listed in the index, some information is not publicly available, e.g., CBI or other information for which disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in the hard copy. Publicly available docket materials are available electronically in https://www.regulations.gov.

The EPA is temporarily suspending its Docket Center and Regional Records Centers for public visitors to reduce the risk of transmitting COVID-19. In addition, many site information repositories are closed and information in these repositories, including the deletion docket, has not been updated with hardcopy or electronic media. For further information and updates on the EPA Docket Center services, please visit us online at https://www.epa.gov/dockets.

The EPA continues to carefully and continuously monitor information from the Centers for Disease Control and Prevention (CDC), local area health departments, and our Federal partners so that we can respond rapidly as conditions change regarding COVID -19. The EPA is committed to continuing our critical work on behalf of the American public while also safeguarding the health and safety of the public and the families of the EPA employees by taking responsible measures to help prevent transmission of the coronavirus. Thank you for your cooperation and understanding.

More information on the Site's Superfund Cleanup Program is available on the Web at: https://eemo.msfc.nasa.gov/eemo/

FOR FURTHER INFORMATION CONTACT: Brad Jackson, Remedial Project Manager, U.S. Environmental Protection Agency, Region 4, 61 Forsyth Street SW, Atlanta GA 30303, (404) 622-2876, email: jackson.brad@epa.gov.

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I. Introduction

The EPA Region 4 announces its intent to delete the surface water, sediment, soil and groundwater of OU-09 and the soil (including sediment) of OU-12 of the George C. Marshall Space Flight Center (MSFC) portion of the Redstone Arsenal (USARMY/NASA) Superfund site from the National Priorities List (NPL) and requests public comment on this proposed action. Groundwater beneath OU-12 is being addressed under CERCLA as part of the Site-wide Groundwater Operable Unit, OU-03 under the MSFC Federal Facility Agreement (FFA) between NASA, EPA Region 4, and ADEM (effective September 17, 2001). OU-09 and OU-12 are located on the MSFC portion of the NPL Superfund site managed by NASA and are identified by the Army and the EPA as Redstone OU-20 and OU-21, respectively. All other media and OUs which are part of the Redstone Arsenal (USARMY/NASA) Superfund Site are not being considered for deletion as part of this action and will remain on the NPL. The NPL constitutes Appendix B of 40 CFR part 300 which is the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), which the EPA promulgated pursuant to Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended. The EPA maintains on the NPL those sites that appear to present a significant risk to public health, welfare, or the environment. Sites on the NPL may be the subject of remedial

actions financed by the Hazardous Substance Superfund (Fund). This partial deletion of surface water, sediment, soil and groundwater at OU-09 (OU-20 for Redstone Arsenal) and soil an OU-12 (OU-21 for Redstone Arsenal) from the Site is proposed in accordance with 40 CFR Section 300.425(e) and is consistent with the Notice of Policy Change: Partial Deletion of Sites Listed on the National Priorities List (60 FR 55466 [November 1, 1995]). As described in Section 300.425(e)(3) of the NCP, a portion of a site deleted from the NPL remains eligible for Fund-financed remedial action if future conditions warrant such actions.

The EPA will accept comments on the proposal to partially delete this Site for 30 days after publication of this document in the *Federal Register*.

The criteria for deleting sites from the NPL are explained in Section II and the procedures for this action are discussed in Section III. In Section IV, OU-09 (OU-20 for Redstone Arsenal) and OU-12 (OU-21 for Redstone Arsenal) of the MSFC portion of the Redstone Arsenal (USARMY/NASA) Superfund Site are described, along with how they meet the criteria for partial deletions.

II. NPL Deletion Criteria

The NCP establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR Section 300.425(e), sites may be deleted from the NPL where no further response is appropriate. In making a determination pursuant to 40 CFR Section 300.425(e), the EPA will consider, in consultation with the State of Alabama, whether any of the following criteria have been met:

 responsible parties or other persons have implemented all appropriate response actions required;

- ii. all appropriate Fund-financed response under CERCLA has been implemented, and no further response action by responsible parties is appropriate; or
- iii. the remedial investigation has shown that the release poses no significant threat to public health or the environment and, therefore, the taking of remedial measures is not appropriate.

III. Deletion Procedures

The following procedures apply to the deletion of soil and groundwater at OU-09 (OU-20 for Redstone Arsenal) and soil (including sediments) at OU-12 (OU-21 for Redstone Arsenal) of the Site:

- (1) The EPA consulted with the State before developing this Notice of Intent for Partial Deletion;
- (2) The EPA has provided the State 30 working days for review of this action prior to publication of it today;
- (3) In accordance with the criteria discussed above, the EPA has determined that no further response is appropriate;
- (4) On August 30, 2019, the State of Alabama through the Alabama Department of Environmental Management (ADEM) concurred with the deletion from the NPL MSFC portions of the Redstone Arsenal (USARMY/NASA) Superfund Site designated as OU-09 and OU-12;
- (5) Concurrently with publication of this Notice of Intent for Partial Deletion in the *Federal Register*, a notice is being published in a major local newspaper, *The Huntsville Times*. The newspaper announces the 30-day public comment period concerning the Notice of Intent for Partial Deletion of the Site from the NPL; and

(6) The EPA placed copies of documents supporting the proposed partial deletion in the deletion docket, made these items available for public inspection, and copying at the Site information repositories identified above.

If comments on this document are received within the 30-day comment period, the EPA will evaluate and respond accordingly to the comments before making a final decision to delete OU-09 (identified as OU-20 for Redstone Arsenal) and OU-12 (identified as OU-21 for Redstone Arsenal) from the Superfund Site. If necessary, the EPA will prepare a Responsiveness Summary to address any significant public comments received. After the public comment period, if the EPA determines it is still appropriate to delete OU-09 and OU-12 located in MSFC portion of the Redstone Arsenal (USARMY/NASA) Superfund Site, the Regional Administrator will publish a final Notice of Partial Deletion in the *Federal Register*. Public notices, public submissions, and copies of the Responsiveness Summary, if prepared, will be made available to interested parties and included in the site information repositories listed above.

Deletion of a portion of a site from the NPL does not itself create, alter, or revoke any individual's rights or obligations. Deletion of a portion of a site from the NPL does not in any way alter the EPA's right to take enforcement actions, as appropriate. The NPL is designed primarily for informational purposes and to assist the EPA management. Section 300.425(e)(3) of the NCP states that the deletion of a site from the NPL does not preclude eligibility for future response actions, should future conditions warrant such actions.

IV. Basis for Partial Site Deletion

The following information provides the EPA's rationale for deleting OU-09 (identified as OU-20 for Redstone Arsenal) and OU-12 (identified as OU-21 for Redstone Arsenal) located in the MSFC portion of the Redstone Arsenal (USARMY/NASA) Superfund Site from the NPL.

Site Background and History

The Redstone Arsenal (USARMY/NASA) Superfund Site (CERCLIS ID: AL7210020742) is located on the active Redstone Arsenal Army Installation that encompasses 38,300 acres of land southwest of Huntsville, Alabama. Since opening in the early-1940s, development within the Arsenal has largely revolved around the historical need to produce, and later dispose of, conventional and chemical munitions. From 1942 to 1945, the Army's operations were used to manufacture raw materials for toxic agents and incendiary materials and to assemble, store, and ship the final products. Onsite waste disposal activities included the disposal of construction debris, drums, and chemical munitions, as well as the open burning of combustible materials.

After WWII, Redstone Arsenal became a center for the receipt, storage, and demilitarization of Allied and German chemical agents. In 1949, the Arsenal's mission changed to research and development of rocketry and guided missile systems. In 1960, civilian rocketry and missile activities were transferred to the NASA, George C. Marshall Space Flight Center (MSFC), which is located on 1,841 acres within the central portion of the Arsenal.

Since then, the area known as MSFC has been used to develop, test, and manufacture space vehicles and components. MSFC is NASA's principal propulsion development center. NASA uses a state-of-the-art propulsion laboratory for developing and testing the newest propulsion system innovations at MSFC. Its scientists, engineers, and support personnel also play a significant role in managing experiments conducted on the International Space Station and managing and developing the Space Launch System.

The EPA proposed the Redstone Arsenal (USARMY/NASA) site to the NPL on June 23, 1993 (58 FR 34018) and listed the site as final on the NPL on May 31, 1994 (59 FR 27989). MSFC is part of the "fence-to-fence" listing of the Redstone Arsenal (USARMY/NASA) site on the NPL but is managed by NASA. The Army and NASA cleanup programs are separately funded and operated. They coordinate on common programmatic needs such as data sharing, consistent cleanup, and technical issues.

In 2001, the EPA, NASA, and ADEM signed a Federal Facilities Agreement (FFA) under CERCLA Section 120 for the MSFC portion of the site. The FFA integrates both NASA's Resource Conservation and Recovery Act (RCRA) and CERCLA requirements. The FFA requires that NASA will fully investigate environmental impacts associated with past and present activities and take the appropriate cleanup actions. The Site Management Plan required by the FFA establishes schedules, priorities, and enforceable milestones for cleanup activities at the MSFC. To date there has not been an FFA signed between the EPA, the Army, and ADEM for the Redstone Arsenal portion of the Superfund Site.

The MSFC portion of the Superfund Site includes over 80 areas with surface media (e.g., soil, surface water, and sediment) contamination, five groundwater plumes, and 17 subsurface groundwater source areas. Proposed for deletion is OU-09 that addresses former surface water, sediment, soil, and groundwater contamination. Also proposed for deletion is OU-12 which addresses former soil (including sediment) contamination. The docket contains a map depicting these areas.

Description of OU-09 (Recorded by Army as OU-20 for Redstone Arsenal)

OU-9 is the Former Industrial Waste Treatment Facility (IWTF). The first phase of the IWTF was constructed in the 1960s. This phase included only the Industrial Waste

Treatment Basin, which received flows from the industrial sewer. The second phase of the IWTF was constructed in the late-1960s or early-1970s. This phase included the remainder of the IWTF (ultimate lagoons, hydrostatic dump lagoon, concentrate receiving tank, caustic storage tank, transfer tank, and mix tank). This portion of the IWTF was constructed to treat the plating waste from Building 4760. The IWTF operated into the 1980s.

The Former IWTF consists of the following eight components:

- 1. Industrial Waste Treatment Basin (MSFC-044);
- 2. Concentrate Receiving Tank (MSFC-045);
- 3. Transfer Tank (MSFC-046);
- 4. Hydrostatic Dump Lagoon (MSFC-047);
- 5. Mix Tank (MSFC-048);
- 6. East Ultimate Lagoon (MSFC-049);
- 7. West Ultimate Lagoon (MSFC-050); and
- 8. Caustic Storage Tank (MSFC-A).

The IWTF or OU-9 (OU-20 for Redstone Arsenal) is shown on Figure 1.

Description of OU-12 (Recorded by Army as OU-21 for Redstone Arsenal)

OU-12 is the location of the former Stauffer Chemical Plant, which produced chlorine gas for the manufacture of mustard gas during the 1940s. These sites are adjacent to each other in the northern portion of MSFC near the Center's eastern border. OU-12 is bounded by Digney Road on the south, Morris Road on the east, Neal Street on the north, and Building 4207 on the west.

The sites in OU-12 consist of a former building, a nearby drainage ditch, a satellite waste accumulation area, and a product storage area. OU-12 comprises the following individual RCRA solid waste management units (SWMUs):

- 1. Satellite Waste Accumulation Area for Buildings 4241 and 4244 (MSFC-022);
- 2. Portion of Industrial Sewer North of MSFC-034 (MSFC-052a);
- 3. Site of the Former Stauffer Chemical Company Plant (MSFC-055);
- 4. Building 4241 Surface Drainage (MSFC-065);
- 5. Containment Area for Tanks 4234A, B, and C (MSFC-D); and
- 6. Buildings 4241 and 4244 Product Storage Area (MSFC-E).

OU-12 (OU-21 for Redstone Arsenal) is shown as Figure 2.

Remedial Investigation at OU-09 (Recorded by Army as OU-20 for Redstone Arsenal)

Three SWMUs (MSFC-044, MSFC-049, and MSFC-050) were closed under RCRA regulations and certified by ADEM in January 1990. A soil investigation at the remaining five units (MSFC-045, MSFC-046, MSFC-047, MSFC-048, and MSFC-A) was conducted by NASA in May 1996 to provide data for confirmation sampling. A soil investigation at the three RCRA-closed units (MSFC-044, MSFC-049, and MSFC-050) was conducted in May 1997 to provide data for the CERCLA remedial investigation (RI). These data were combined and presented in the MSFC OU-9 RI Report.

The 1999 RI evaluated the eight sites of OU-09 (former IWTF) to determine if a contaminant release had occurred at the site. Surface and subsurface soil samples were collected from borings installed around the remaining five sites (MSFC-045, MSFC-046, MSFC-047, MSFC-048, and MSFC-A), which are concrete structures, and within the sites that are surface

impoundments lined with clay. Subsurface soil samples were collected from the natural soil beneath the locations where the RCRA-closed sites (MSFC-044, MSFC-049, and MSFC-050) were placed. Groundwater at OU-09 was evaluated through RCRA-required quarterly sampling for the closed units. The 1999 RI included a baseline risk assessment for soil and groundwater.

Soil and groundwater associated with OU-09 were proposed for no further action (NFA) in the OU-09 RI Report. Based on information provided in the report, it was concluded that further investigation of the soil and groundwater, monitoring of the groundwater under RCRA, and remedial action for soils were not necessary to ensure the protection of human health and the environment.

Remedial Investigation and Feasibility Study at OU-12 (Recorded by Army as OU-21 for Redstone Arsenal)

The 2008 OU-12 RI Report addressed the surface media at the OU-12 sites, including contaminated surface soil, subsurface soil, and sediment. Groundwater at the NASA-administered MSFC property is addressed in the FFA as OU-03 Site-wide Groundwater Operable Unit. The OU-12 RI included human health and ecological risk assessments for soil (including sediment), which are discussed in the OU-12 RI report, along with an evaluation of options for implementing non-time-critical removal actions.

Chemicals of concern (COCs) identified for OU-12 as a whole included polynuclear aromatic hydrocarbons (PAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene), polychlorinated biphenyls or PCBs (Aroclor-1260 and Aroclor-1254), dieldrin, iron, and lead. Individual RCRA SWMUs located within OU-12 generally exhibited a subset of the COCs.

The results of the risk assessments indicated that response actions for contaminated soil and sediment were necessary to protect the public health and welfare or the environment from actual or threatened releases of hazardous substances into the environment.

NASA identified the following six remedial action alternatives in a Feasibility Study (FS) Report for consideration at OU-1-2:

- 1) No action;
- 2) Institutional Controls with Monitoring;
- 3) Capping;
- 4) Removal and offsite disposal to meet the residential risk criteria;
- 5) Removal and offsite disposal to meet the industrial risk criteria; and
- 6) Treatment.

At the conclusion of the remedial action alternative evaluation process, the recommended remedial action alternative for OU-12 provided in the Proposed Plan was removal of contaminated soil (including sediment) and offsite disposal to meet the residential risk criteria. Because of this method's effectiveness in reducing the risk associated with soil (including sediments) contamination to acceptable residential risk levels there was no need for land use controls (LUCs) to prevent exposure at the OU-12 Area. The Final Proposed Plan: Remedial Action at OU-12 (June 2010) sought public comments on the Preferred Alternative. NASA received no comments on the Proposed Plan during the 30-day public comment period.

Selected Remedy for OU-09 (Recorded by Army as OU-20 for Redstone Arsenal)

The Record of Decision (ROD) for OU-09, which recommended no further action (NFA), was signed by the EPA and NASA in 2000, along with concurrence by the State. The 2000 ROD documents that no CERCLA response action was necessary for OU-09 in order to protect human

health and the environment and five-year reviews under CERCLA Section 121(c) would not be necessary for the soil or groundwater at OU-09.

Two years after the ROD was signed, ADEM requested that NASA prepare and submit a Clean Closure Equivalency Demonstration (CCED) for the three former RCRA units (MSFC-044, MSFC-049, and MSFC-050) within OU-09. The CCED presented the data, information, and risk assessment in a similar manner as the 1999 OU-09 RI Report. In addition, a revised screening level human health risk evaluation was conducted for the eight SWMUs to demonstrate that no further remedial action under CERCLA is warranted. The 1999 risk evaluation was revised to incorporate more current toxicity values, as well as to incorporate new site characterization data to fills data gaps identified by the regulatory agencies during their review of the CCED and the 2000 ROD, which was issued by the EPA for OU-09 (NASA, 2000a). The results are integrated into the 2006 Final CCED. The residential risk assessment for the CCED demonstrated that site surface and subsurface soil do not pose a significant risk; sitewide NASA groundwater and sediment issues remaining are being managed under the sitewide OU-03 Groundwater Operable Unit.

Selected Remedy for OU-12 (Recorded by Army as OU-21 for Redstone Arsenal)

NASA identified five areas of OU-12 that required the removal and disposal of contaminated soil (including sediment) to meet the residential risk criteria, as well as the removal and disposal of the entire length of industrial sewer pipeline within OU-12. Additionally, abandonment of select manholes by removing sediment and filling the manholes with grout to 1-foot below ground surface (bgs) was included in the selected remedy. The selected remedy was presented in the OU-12 ROD, which was signed by the EPA and NASA in 2012, along with State concurrence.

The remedial action objectives (RAOs) for the OU-12 remedial action were as follows:

- Prevent unacceptable human exposures (dermal contact, ingestion, inhalation) to
 contaminated surface soil, subsurface soil, and sediment by removing contaminated soil
 and sediment so that the concentrations of contamination are below the EPA Region 9
 industrial and/or residential preliminary remediation goal (PRG) levels or applicable
 background levels (inorganic parameters only);
- Prevent the migration of contaminated soil (including sediment) offsite via stormwater runoff in ditches; and
- Clean up to a level that allows for unrestricted use and unlimited exposure at OU-12.

The 2012 ROD also documented significant changes to the preferred remedial alternative presented in the Proposed Plan (PP). In accordance with the 2009 action memorandum for the time-critical removal action (TCRA) for OU-12, approximately 350 feet of the 10-inch-diameter, vitrified clay pipeline on either side of manhole MHI-136 and associated with MSFC-052a (beneath the potential sodium hydroxide area of OU--12) were removed and disposed in an off-site landfill in 2010. The removal of this portion of pipeline is discussed in the 2018 OU-12 Removal Action Completion Report (RACR). The section of the industrial sewer pipeline removed during of the TCRA is part of MSFC-052a, the rest of which was removed as part of the 2012 ROD selected remedy.

Additionally, because soils and sediment at OU-12 were cleaned to unlimited use/unrestricted exposure (UU/UE) levels, the 2012 ROD documented a non-significant change. At the EPA's request, the remedial action alternative of institutional controls (ICs) with monitoring was removed from the ROD as an independent alternative since ICs with monitoring

is part of other remedial alternatives. This was documented as a change to the Administrative Record for the selected remedy for OU-12.

Response Action for OU-09 (Recorded by Army as OU-20 for Redstone Arsenal)

As described above, a CERCLA response action was not required at OU-09 since conditions at the site did not pose an unacceptable risk to human health and the environment as verified with several investigations under both RCRA and CERCLA.

Response Action for OU-12 (Recorded by Army as OU-21 for Redstone Arsenal)

The selected response action was summarized in the Proposed Plan issued for public comment in 2010. The final approved remedial actions are documented in the ROD issued in 2012 and implemented through the 2012 Remedial Design (RD).

The selected remedy for the OU-12 remedial action included the removal of soil (including sediment) and offsite disposal to meet the residential risk criteria for surface soil, subsurface soil, and sediment contamination. For the former industrial sewer (MSFC-052a), NASA proposed to remove and dispose of each pipeline section and abandon each manhole by cutting them down approximately 1-foot below grade and filling each with cement and bentonite grout. The selected remedy accomplished the RAOs and met the CERCLA requirements for implementing remedial actions. The selected remedy achieved residential cleanup levels so that the site was suitable for unlimited use and unrestricted exposure (UU/UE) and eliminated the need for statutory five-year reviews per CERCLA Section 121(c) and land use controls (LUCs) which include use or activity restrictions to prevent unacceptable exposure to contamination left in place. No further monitoring and maintenance are required at OU-12.

Additional information led NASA to prepare an addendum to the RD in 2014 and an ESD in 2015. These documents provide the basis for the following changes to the scope of the OU-12 remedial action:

- Based on confirmation samples collected during the MSFC-D area excavation, an additional 2,200 cubic yards (yd³) of impacted soil requiring remediation were identified and incorporated into Remedial Area (RA) 4;
- Two segments of industrial sewer pipeline could not be removed as originally planned. A segment within, and south of, RA-8 could not be removed because of the presence of an adjacent active sanitary sewer line made of fragile vitrified clay. The northern segment (near Buildings 4241 and 4244) could not be removed because of the potential to damage the foundation of Building 4241. These segments of the industrial sewer were abandoned in place;
- To improve excavation efficiency, staging piles instead of roll-off boxes were used for temporary storage of excavated soil during excavations in 2015. The soil in the staging piles was characterized, and nonhazardous contaminated material was loaded into dump trucks for waste disposal at an approved off-site RCRA permitted solid waste landfill. Soil considered RCRA hazardous waste was disposed in approved off-site RCRA permitted Subtitle C hazardous waste landfill; and
- As documented in the 2014 OU-12 RD Addendum, the names of several excavation areas within MSFC-D were revised and included within RA-4, as the areas fell within or near the revised RA excavation area boundary. In addition to the changes detailed in the 2014 OU-12 RD Addendum. The following additional changes were made, which are summarized in the 2018 Remedial Action Completion Report (RACR):

- During preparation for pressure-washing and grouting of the sewer lines near
 Building 4244, it was determined that no portion of the industrial sewer was
 connected to Building 4244 and that a previously unknown portion of the industrial
 sewer was present that extended parallel to, and connected with, the north side of
 Building 4241. These pipelines were disconnected from Building 4244 and plugged at
 an unknown time;
- During the site preparation phase, it also was discovered that the amount of industrial sewer south of RA-8 that would need to be grouted in place was underestimated in the 2014 OU-12 RD Addendum, because the active, fragile, vitreous clay sanitary sewer was adjacent to the industrial sewer line for a greater distance than had previously been thought. Therefore, the amount of sewer line abandoned in place increased;
- It was determined that no excavation would occur within 5 feet of the high value fiber optic communication line that was exposed in Ditch B, south of the intersection of Ditch B and Ditch C, due to the potential catastrophic consequences of any damage to this utility. This cable was contained in a terra cotta tile at the ditch crossing, which may have been damaged or broken during a heavy rain event prior to the OU-12 remedial action;
- The northern end of Ditch B was not excavated as originally designed. A relatively large concrete apron was identified as existing in this area. A historical RI sample (SX12-009) was collected atop this apron; when the remedial action for the Ditch B area began, most sediment and/or soil deposits were washed from this apron. It is likely that the remediation of Ditch D, Ditch E, Ditch F, and Ditch G (mostly brush

clearing activities) resulted in elevated surface water flow during storm events, which aided in removing the soil atop this concrete apron. Remedial actions were not required in this area of Ditch B, and field personnel were unable to collect agency-requested sample SS12-263;

- Additional minor deviations from the 2012 OU-12 RD Report occurred that were driven
 by field conditions, such as minor shifts to the outline of the excavation areas, increasing
 the depth of excavation, and adjusting the work zones;
- Site conditions impacted the remedial plans for RA-8B. The proposed excavation plan (5-feet by 5-feet by 5-feet) changed into an elongated, trench-like excavation when a concrete-lined basin/slab was encountered. Soil was excavated to the horizontal and vertical walls of this area. Although the deepest confirmation sample results from station SB12-110B showed elevated concentrations of lead, impacted soil from this area was removed and the risk was mitigated.

The RACR documents the remedial action conducted at OU-12. A residual risk evaluation was also included in the RACR to assess the residual risk associated with the remaining sewer sections and exposure to potential contamination at the unexcavated area south of the intersection of Ditch B and Ditch C.

The potential risks associated with exposure to the limited volume of sediment, if present, in the remaining sections of sewer pipeline at MSFC-052a are expected to be within acceptable levels for ecological receptors, as well as for industrial receptors and hypothetical future residents. Therefore, no additional investigations or LUCs were recommended for the areas within the remaining sewer sections.

The estimated carcinogenic risks associated with the unexcavated ditch areas for all scenarios were less than ADEM's target risk level of 1 x 10⁻⁵ and the estimated noncarcinogenic hazard indexes for all scenarios were less than the target hazard index of 1. The estimated carcinogenic risks were within the EPA's Superfund Program target risk range (1 x 10⁻⁶ to 1 x 10⁻⁴) for location SX12-012 and for the combined data from the upgradient locations SX12-012, and SS12-232. The estimated carcinogenic risks for location SS12-232 met the EPA's target risk range, specifically the point of departure level of 1 x 10⁻⁶. Therefore, the potential risks associated with exposures to the unexcavated soil are within acceptable levels for an unrestricted land use scenario and no additional investigations or LUCs are recommended for soil at this area.

Soil and sediment removal activities at OU-12 began in September 2012 and were completed in May 2015, and site restoration activities were completed September 2015.

Approximately 16,895 yds³ cubic yards of contaminated soil (including sediment) were removed and disposed of offsite in approved RCRA permitted landfills. A total of 868 linear feet of industrial sewer pipeline was removed and a total of 187 yds³ of grout was used to fill the portions of the industrial sewer that could not be excavated.

Cleanup Levels for OU-09

Remedial cleanup levels were not developed for OU-09 because remedial actions were not required at OU-09 since site conditions were determined to not present an unacceptable risk to human health and the environment.

Cleanup Levels for OU-12

Cleanup levels were developed for soil COCs (PAHs, PCBs, dieldrin, iron, and lead) at OU-21 on the basis of the EPA Region 9 PRGs listed for industrial and residential scenarios or on the basis of a background value for a particular parameter (iron), and therefore, the final

remedy cleaned up OU-12 to residential standards suitable for UU/UE. The following are the cleanup levels for COCs at OU-12:

- PAH (as benzo(a)pyrene equivalent) 60 micrograms per kilogram (μg/kg) (residential)
 or 210 μg/kg (industrial);
- PCBs 220 μg/kg (residential) or 740 μg/kg (industrial);
- Dieldrin 30 μg/kg (residential) or 110 μg/kg (industrial);
- Lead 400 milligrams per kilogram (mg/kg) (residential) or 800 mg/kg (industrial); and
- Iron -66,400 mg/kg.

The cleanup level for iron is the subsurface soil background value, as referenced in the OU-12 RI Report (NASA, OU-12, 2008). The iron background value was used instead of the EPA Region 9 PRG despite that the background value is one order of magnitude higher than the PRG., the EPA policy does not require CERCLA cleaning up to below background levels in soils provided the levels are protective of human health and the environment. This cleanup level was obtained at OU-12.

Operation and Maintenance, If Applicable

Neither OU-09 nor OU-12 require any operation and maintenance (O&M) activities. All cleanup objectives in the RODs were met, and no further remedial action or O&M is required.

Five-Year Review, If Applicable

NASA conducted a statutory Five-Rear Review (FYR) of the MSFC Site in 2013 and 2018 in accordance with CERCLA Section 121(c). The 2018 FYR confirmed that soil and groundwater at OU-09 and soil (including sediment) at OU-12 met UU/UE criteria and further reviews are not required for either OU-09 and OU-12 (OU-20 or OU-21, respectively for Redstone Arsenal).

The soil media at OU-09 was recommended for NFA in the final 2000 ROD. To address the EPA and ADEM comments with respect to a residential risk evaluation, NASA collected additional soil samples at OU-09 and submitted a 2016 CCED. The FFA parties determined that the site met residential exposure levels and no further action required.

Remedial actions are complete for soil (including sediment) at OU-12 and any residual risks for that media are considered to be protective of human health and the environment for future unrestricted residential use and therefore does not require LUCs.

Community Involvement

The EPA and ADEM satisfied public participation activities as required in CERCLA Section 113(k), 42 United States Code (U.S.C.) 9613. The EPA published notifications in *The Huntsville Times* announcing the FYR and inviting the public to comment and express their concerns about the Site at the start of the 2013 and 2018 FYRs as well as offer public comment for proposed plans for all of the EPA Site decision documents and this proposed NPL partial deletion. The Administrative Record file contains the documentation NASA considered in selecting the CERCLA response actions for both OU-09 and OU-12 in accordance with the NCP requirements.

Determination that the Criteria for Deletion have been Met

OU-09 (including surface water, sediment, soil, and groundwater) and OU-12 (soil including sediment) meet all of the site completion requirements as specified in Office of Solid Waste and Emergency Response Directive 9320.2-22, *Close Out Procedures for National Priorities List Sites*. The EPA has followed NPL deletion procedures required by NCP at 40 CFR 300.425(e).

Soil and groundwater associated with OU-09 were proposed for NFA in the CERCLA 1999 OU-09 RI Report. The 2000 ROD selected NFA for OU-09. MSFC, ADEM, and the EPA concurred that additional remedial actions are not required at OU-09 to protect of human health and the environment and approved the ROD.

All cleanup actions specified in the OU-12 ROD have been implemented, and the Site has achieved the degree of cleanup or protection specified in the ROD and met ROD remedial action objectives. The soil (including sediment) area proposed for partial deletion has been cleaned up to residential risk levels for soil exposure pathways. The RAOs and associated cleanup goals are consistent with agency policy and guidance. Groundwater beneath OU-12 (OU-21 for Redstone Arsenal) is being investigated by NASA under the FFA as part of OU-3 Site-wide Groundwater and, therefore, is not included in this proposed deletion action.

The EPA has determined that no further Superfund response is necessary at OU-09 and OU-12 -to protect human health and the environment and supports the partial deletion of these operable units from the MSFC portion of the Redstone Arsenal (USARMY/NASA) Superfund Site.

The NCP (40 CFR Section 300.425(e)) states that a site may be deleted from the NPL when no further response action is appropriate. The EPA, in consultation with the State of Alabama, has determined that all required response actions have been implemented and no further response action by the responsible parties is appropriate for these identified OUs at the MSFC.

List of Subjects in 40 CFR Part 300

Environmental protection, Air pollution control, Chemicals, Hazardous waste, Hazardous

substances, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements,

Superfund, Water pollution control, Water supply.

Authority: 33 U.S.C. 1251et seq..

Dated: June 26, 2020.

Mary Walker, Regional Administrator

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